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ABSTRACT

Despite predictions in the 1950's and 1960's that computer technology would reduce job opportunities by 90%, historical data published by the Department of Labor reveal that total manpower demands accelerated from 1947 through 1977 and were primarily satisfied by a decreased demand for farm laborers, an increase in percentage of women in the workforce, and the post-World War II baby boom. Changes in these trends, however, pose the imminent possibility that the labor supply will no longer be able to keep up with the demand. Indeed, it now appears that the number of 18-year-olds entering the workforce will diminish and that agricultural employment and the percentage of women entering the labor market will stabilize. In addition, jobs lost to computerization will continue to be offset by employment opportunities left in the wake of new technologies and markets. While deferred retirement and increased immigration may help the country meet this labor demand, the greatest potential labor supply consists of the ten to 20 million individuals who are not in the labor force, but who would join if provided with adequate job training. Educators, therefore, should draw upon their past experiences with CETA (Comprehensive Employment and Training Act) and other federal vocational programs to develop future plans to close the training gap between these individuals and productive employment. The report includes data tables and graphs detailing employment trends from 1947 through 1977. (JP)

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# THE IMMINENT MANPOWER CRISIS:

# AN OPPORTUNITY FOR SOCIETY'S REJECTS

by

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Presented to the World Future Society
Amhurst, Massachusetts
November 7, 1980

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Manpower demand forecasting has always been a rather inexact science given all of the variables present even in a "surprise-free" environment. Projected on a national or international level, such variables as economic changes, changing human values, localized hostilities, political changes, migration, and similar events affect total demand, making less reliable the forecasts. Even the knowledge of a major impact (surprise), if taken alone, can result in errors in forecasting.

Given the rapid technological changes occurring in the 1940's and 1950's with even more change projected for the future, forecasters following that period predicted drastic changes in manpower demand. An often-quoted popular forecast made during the 1950's and 1960's predicted that by the turn of the century, 10% of the total population would do the meaningful work for society. This projection was based upon reliable (and, subsequently, fulfilled) projections of the impact of automation and computers in reducing the requirements for workers in routine, repetitive, often strenuous, jobs in the factory and in the office.

Serious papers, conferences, and books were developed concerning the future of work in the work place. Not only were these concerned with the changing nature of work in the work place, but also with alarm about what 90% of the population would do if 10% would be able to do the meaningful work, given traditional human values about the work ethic.

Many at that time predicted that activities, such as those involving traditional charitable and leisure activities, would become paid jobs in the future, thus expanding the definition of "meaningful" work. Indeed, this has happened to a minor extent. In the human services, arts, and recreation, paid employment has expanded rapidly in such areas as welfare, child care, geriatrics, parole, visiting artists, public symphonies, parks and recreation.

Still, history has shown the projected reduction in total manpower demand in the United States to be completely in error, in fact, just the opposite has occurred (see Table 1). Instead of turning downward over the past 30 years (1947-77), the total labor force of the United States has been accelerating.

Instead of worrying about what "unemployed" populations would do, had the forecasters been aware of the trend, they would have been concerned from whence the additional labor force would come.

TABLE 1. Employment Status of U. S. Population (From Handbook of Labor Statistics, 1978)

Persons 16 years of age and over; numbers in thousands

| Sex and year | Total noninstitutional population | Total labor force | | Civilian labor force | | | | | | | Not in labor force |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Number | Percent of population | Total | Employed | | | Unemployed | | | |
| | | | | | Total | Agriculture | Nonagricultural industries | Number | Percent of labor force | | |
| | | | | | | | | | Not seasonally adjusted | Seasonally adjusted | |
| **BOTH SEXES** | | | | | | | | | | | |
| 1947 | 103,418 | 60,941 | 58.9 | 59,350 | 57,038 | 7,890 | 49,148 | 2,311 | 3.9 | | 42,477 |
| 1948 | 104,527 | 62,080 | 59.4 | 60,621 | 58,343 | 7,629 | 50,714 | 2,276 | 3.8 | | 42,447 |
| 1949 | 105,611 | 62,903 | 59.6 | 61,286 | 57,651 | 7,658 | 49,993 | 3,637 | 5.9 | | 42,708 |
| 1950 | 106,645 | 63,858 | 59.9 | 62,208 | 58,918 | 7,160 | 51,758 | 3,288 | 5.3 | | 42,787 |
| 1951 | 107,721 | 65,117 | 60.4 | 62,017 | 59,961 | 6,726 | 53,235 | 2,055 | 3.3 | | 42,604 |
| 1952 | 108,823 | 65,730 | 60.4 | 62,138 | 60,250 | 6,500 | 53,749 | 1,883 | 3.0 | | 43,093 |
| 1953[1] | 110,601 | 66,560 | 60.2 | 63,015 | 61,179 | 6,260 | 54,919 | 1,834 | 2.9 | | 44,041 |
| 1954 | 111,671 | 66,993 | 60.0 | 63,643 | 60,109 | 6,205 | 53,904 | 3,532 | 5.5 | | 44,678 |
| 1955 | 112,732 | 68,072 | 60.4 | 65,023 | 62,170 | 6,450 | 55,722 | 2,852 | 4.4 | | 44,660 |
| 1956 | 113,811 | 69,409 | 61.0 | 66,552 | 63,799 | 6,283 | 57,514 | 2,750 | 4.1 | | 44,402 |
| 1957 | 115,065 | 69,729 | 60.6 | 66,929 | 64,071 | 5,947 | 58,123 | 2,859 | 4.3 | | 45,336 |
| 1958 | 116,363 | 70,275 | 60.4 | 67,639 | 63,036 | 5,586 | 57,450 | 4,602 | 6.8 | | 46,088 |
| 1959 | 117,881 | 70,921 | 60.2 | 68,369 | 64,630 | 5,565 | 59,065 | 3,740 | 5.5 | | 46,960 |
| 1960[1] | 119,759 | 72,142 | 60.2 | 69,628 | 65,778 | 5,458 | 60,318 | 3,852 | 5.5 | | 47,617 |
| 1961 | 121,343 | 73,031 | 60.2 | 70,459 | 65,746 | 5,200 | 60,546 | 4,714 | 6.7 | | 48,312 |
| 1962[1] | 122,981 | 73,442 | 59.7 | 70,614 | 66,702 | 4,944 | 61,759 | 3,911 | 5.5 | | 49,539 |
| 1963 | 125,154 | 74,571 | 59.6 | 71,833 | 67,762 | 4,687 | 63,076 | 4,070 | 5.7 | | 50,583 |
| 1964 | 127,224 | 75,830 | 59.6 | 73,091 | 69,305 | 4,523 | 64,782 | 3,786 | 5.2 | | 51,394 |
| 1965 | 129,236 | 77,178 | 59.7 | 74,455 | 71,088 | 4,361 | 66,726 | 3,366 | 4.5 | | 52,058 |
| 1966 | 131,180 | 78,893 | 60.1 | 75,770 | 72,895 | 3,979 | 68,915 | 2,875 | 3.8 | | 52,288 |
| 1967 | 133,319 | 80,793 | 60.6 | 77,347 | 74,372 | 3,844 | 70,527 | 2,975 | 3.8 | | 52,527 |
| 1968 | 135,562 | 82,272 | 60.7 | 78,737 | 75,920 | 3,817 | 72,103 | 2,817 | 3.6 | | 53,291 |
| 1969 | 137,841 | 84,239 | 61.1 | 80,733 | 77,902 | 3,606 | 74,296 | 2,831 | 3.5 | | 53,602 |
| 1970 | 140,182 | 85,903 | 61.3 | 82,715 | 78,627 | 3,462 | 75,165 | 4,088 | 4.9 | | 54,280 |
| 1971 | 142,596 | 86,929 | 61.0 | 84,113 | 79,120 | 3,387 | 75,732 | 4,998 | 5.9 | | 55,666 |
| 1972[1] | 145,775 | 88,991 | 61.0 | 86,542 | 81,702 | 3,472 | 78,230 | 4,840 | 5.6 | | 56,785 |
| 1973[1] | 148,263 | 91,040 | 61.4 | 88,714 | 84,409 | 3,452 | 80,957 | 4,304 | 4.9 | | 57,222 |
| 1974 | 150,827 | 93,240 | 61.8 | 91,011 | 85,936 | 3,492 | 82,443 | 5,076 | 5.6 | | 57,587 |
| 1975 | 153,449 | 94,793 | 61.8 | 92,613 | 84,783 | 3,380 | 81,403 | 7,830 | 8.5 | | 58,656 |
| 1976 | 156,048 | 96,917 | 62.1 | 94,773 | 87,485 | 3,297 | 84,188 | 7,288 | 7.7 | | 59,130 |
| 1977 | 158,559 | 99,534 | 62.8 | 97,401 | 90,546 | 3,244 | 87,302 | 6,855 | 7.0 | | 59,025 |

| Sex and year | Total noninstitutional population | Total labor force | | Not in labor force |
|---|---|---|---|---|
| | | Number | Percent of population | |
| **Males** | | | | |
| 1947 | 50,968 | 44,258 | 86.8 | 6,710 |
| 1948 | 51,439 | 44,729 | 87.0 | 6,710 |
| 1949 | 51,922 | 45,097 | 86.9 | 6,825 |
| 1950 | 52,352 | 45,446 | 86.8 | 6,906 |
| 1951 | 52,788 | 46,063 | 87.3 | 6,725 |
| 1952 | 53,248 | 46,416 | 87.2 | 6,832 |
| 1953[1] | 54,248 | 47,131 | 86.9 | 7,117 |
| 1954 | 54,706 | 47,275 | 86.4 | 7,431 |
| 1955 | 55,122 | 47,488 | 86.2 | 7,634 |
| 1956 | 55,547 | 47,914 | 86.3 | 7,633 |
| 1957 | 56,082 | 47,964 | 85.5 | 8,118 |
| 1958 | 56,640 | 48,126 | 85.0 | 8,514 |
| 1959 | 57,312 | 48,405 | 84.5 | 8,907 |
| 1960[1] | 58,144 | 48,870 | 84.0 | 9,274 |
| 1961 | 58,826 | 49,193 | 83.6 | 9,633 |
| 1962[1] | 59,626 | 49,395 | 82.8 | 10,231 |
| 1963 | 60,627 | 49,835 | 82.2 | 10,792 |
| 1964 | 61,556 | 50,387 | 81.9 | 11,169 |
| 1965 | 62,473 | 50,946 | 81.5 | 11,527 |
| 1966 | 63,351 | 51,560 | 81.4 | 11,792 |
| 1967 | 64,316 | 52,397 | 81.5 | 11,919 |
| 1968 | 65,345 | 53,030 | 81.2 | 12,315 |
| 1969 | 66,365 | 53,688 | 80.9 | 12,677 |
| 1970 | 67,407 | 54,343 | 80.6 | 13,066 |
| 1971 | 68,512 | 54,797 | 80.0 | 13,715 |
| 1972[1] | 69,864 | 55,671 | 79.7 | 14,193 |
| 1973[1] | 71,020 | 56,479 | 79.5 | 14,541 |
| 1974 | 72,253 | 57,349 | 79.4 | 14,904 |
| 1975 | 73,494 | 57,706 | 78.5 | 15,788 |
| 1976 | 74,739 | 58,397 | 78.1 | 16,341 |
| 1977 | 75,981 | 59,467 | 78.3 | 16,514 |

| Sex and year | Total noninstitutional population | Total labor force | | Not in labor force |
|---|---|---|---|---|
| | | Number | Percent of population | |
| **Females** | | | | |
| 1947 | 52,450 | 16,683 | 31.8 | 35,767 |
| 1948 | 53,088 | 17,351 | 32.7 | 37,737 |
| 1949 | 53,689 | 17,806 | 33.2 | 35,883 |
| 1950 | 54,293 | 18,412 | 33.9 | 35,881 |
| 1951 | 54,933 | 19,054 | 34.7 | 35,879 |
| 1952 | 55,575 | 19,314 | 34.8 | 36,261 |
| 1953[1] | 56,353 | 19,429 | 34.5 | 36,924 |
| 1954 | 56,965 | 19,718 | 34.6 | 37,247 |
| 1955 | 57,610 | 20,584 | 35.7 | 37,026 |
| 1956 | 58,264 | 21,495 | 36.9 | 36,769 |
| 1957 | 58,983 | 21,765 | 36.9 | 37,218 |
| 1958 | 59,723 | 22,149 | 37.1 | 37,574 |
| 1959 | 60,569 | 22,516 | 37.2 | 38,053 |
| 1960[1] | 61,615 | 23,272 | 37.8 | 38,343 |
| 1961 | 62,517 | 23,838 | 38.1 | 38,679 |
| 1962[1] | 63,355 | 24,047 | 38.0 | 39,308 |
| 1963 | 64,527 | 24,736 | 38.3 | 39,791 |
| 1964 | 65,668 | 25,443 | 38.7 | 40,225 |
| 1965 | 66,763 | 26,232 | 39.3 | 40,531 |
| 1966 | 67,829 | 27,333 | 40.3 | 40,496 |
| 1967 | 69,003 | 28,395 | 41.2 | 40,608 |
| 1968 | 70,217 | 29,242 | 41.6 | 40,976 |
| 1969 | 71,476 | 30,551 | 42.7 | 40,924 |
| 1970 | 72,774 | 31,560 | 43.4 | 41,214 |
| 1971 | 74,084 | 32,132 | 43.4 | 41,952 |
| 1972[1] | 75,911 | 33,320 | 43.9 | 42,918 |
| 1973[1] | 77,242 | 34,561 | 44.7 | 42,516 |
| 1974 | 78,575 | 35,892 | 45.7 | 42,683 |
| 1975 | 79,954 | 37,087 | 46.4 | 42,868 |
| 1976 | 81,309 | 38,520 | 47.4 | 42,789 |
| 1977 | 82,577 | 40,067 | 48.5 | 42,510 |

Thirty-year History

Using statistics from the Handbook of Labor Statistics, 1978, published by the U. S. Department of Labor (1979), labor source trends can be tabulated (see Figure 1).

It is the thesis of this paper that the requirements for additional personnel in the labor force as demonstrated by this data have been principally met by three phenomena, namely, the automation of agriculture and the reduction in the requirements for farm labor, the increased participation of women in the labor force, and the coming of age of the post-World War II baby boom.

Figure 1 graphically demonstrates the changes in the total work force from 1947 to 1977, indicating an increase in the total work force of 63.3%, an increase in the male labor force of 34.4%, female 140.2%, and agriculture a reduction of 33.5%.

Agricultural Labor Force

From 1947 to 1977, the percent of the non-institutionalized total population age sixteen and over (this category will subsequently be referred to as "total population") involved in agriculture dropped from 12.9% to 3.3% in the United States. Had the percentage remained constant at 12.9%, an additional 9.6 million people would be required in Agriculture. Thus, farm automation and other influences which reduce the percentage of population required in agriculture have freed this population for work in other areas.

Women in the Labor Force

For a variety of reasons, women have continued to participate in the labor force at an increasing percentage during this thirty-year period. Those reasons probably include changing views of the role of women in American society and forced participation for economic reasons. In 1947 the percent of the total female population participating in the work force was 31.8% and in 1977 it was 48.9% (in 1980 it is estimated at 52%). Had the percentage of women participating in the labor force remained at a constant 31.8%, there would be 13.8 million fewer women working today than actually are. This influence is graphically shown in Figures 1 and 2.

Men in the Work Force

Somewhat unexpected, the percentage of the male population participating in the work force dropped from 86.8% in 1947 to 76.3% in 1977. Since these statistics apply to the total population over 16 years of age, the majority of this drop can be attributed to the tendancy of both men and women to remain in education for a longer period of time. Had the percentage of male participation remained at 86.8%, there would have been 6.5 million more men available in the work force today than there are.

Figure I. Total Labor Force
By Category and % Change, 1947-77

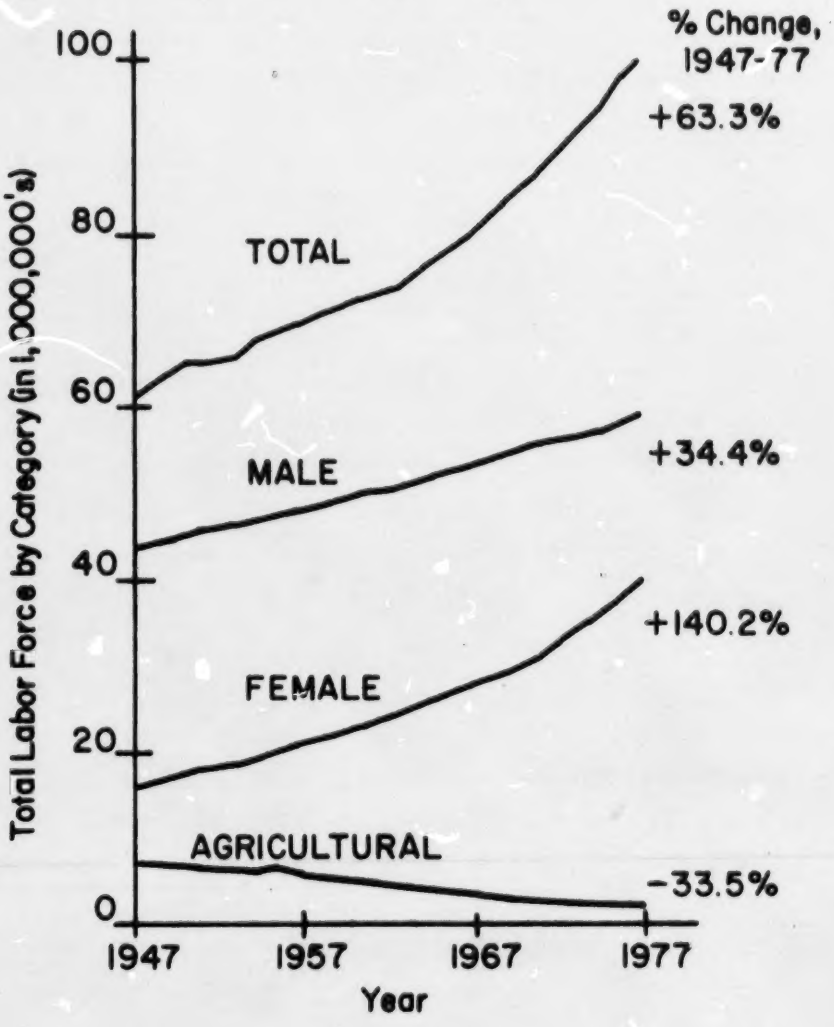
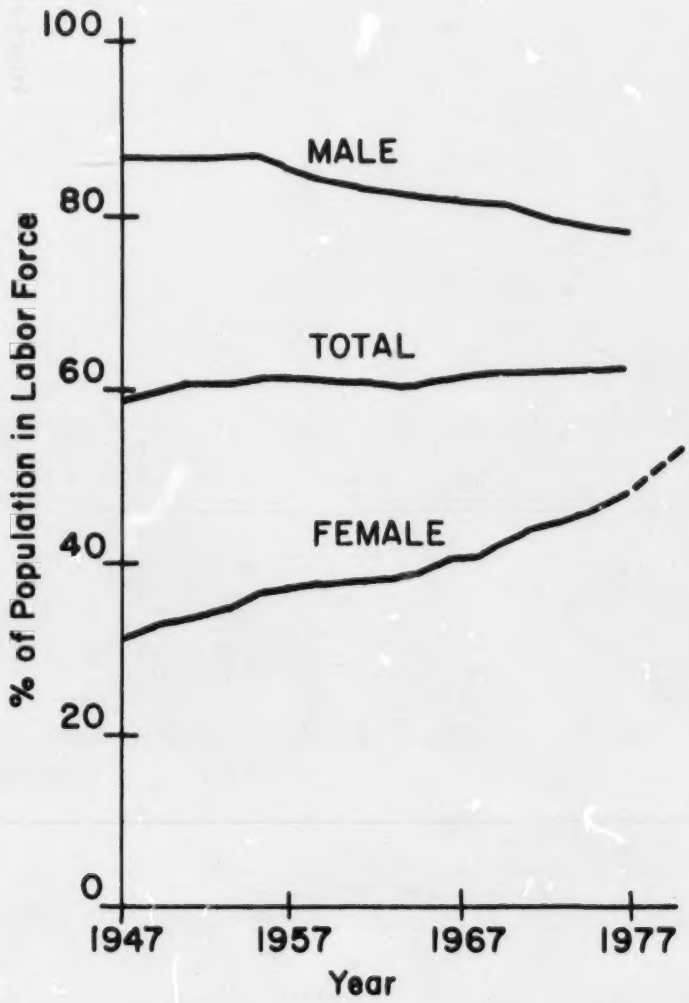


**Figure 2. Percent of Population in the Labor Force, 1947-77**



Influence of the Baby Boom

A final major effect on the total supply of input to the labor force has been the increased population due to the influences of the post-World War II baby boom. The influences of this boom rapidly expanded the elementary and secondary school populations in the 1960's and higher education in the 1970's. The cycle of reduced births in the 1960's (see Figure 3) contributed to reduced elementary and secondary populations in the 1970's and to projected reductions in post-secondary enrollments during the 1980's. Current estimates show that the eighteen year old population in the United States will drop by 23% from 1979 to 1992.

Based upon statistics concerning the increase in the eighteen year old population from 1947 to 1977, an estimated 22.8 million additional individuals were added to the labor force over that thirty-year period.

Other Influences

Other influences adding or detracting from the labor supply include unemployment, migration, and retirement. Had the unemployment rate remained constant at 3.9% as it was in 1947 instead of rising to 7.0% in 1977, there would have been 3.3 million additional workers available to the labor force. Although immigration contributed very little to the labor supply during the early part of the thirty-year period, its effect has started to become significant in the latter period and will continue to be so into the future. Changing attitudes, laws, and practices in retirement, saw a reduction in the average retirement age in the early part of the period but an increase in the latter part, probably balancing itself out over the thirty-year period. It is expected that delayed retirement will contribute somewhat to the labor force in the near future.

Future Influences on Labor Supply and Demand

In Figure 4, the change in the non-agricultural U. S. labor force is graphically illustrated. The figure further shows the probable influences of the reduction in the percentage of farm workers, the increased participation of women in the labor force, and the influences of a growth cycle in the U. S. population.

Looking to the future, it cannot be anticipated that the current percentage of the total population employed in agriculture can be reduced significantly if at all. Also, it cannot be anticipated that a significant new supply of labor force can be obtained by increased participation of women in the work force, rather, one could expect this to decelerate and stabilize at around 60%. Finally, increases in the labor force due to the influx of eighteen year olds is certainly not expected to continue, is not expected to stabilize, but can certainly be depended upon to decrease inasmuch as future eighteen year olds are already with us and can be reliably counted.

**Figure 3. Live Births in U.S., 1937-77**

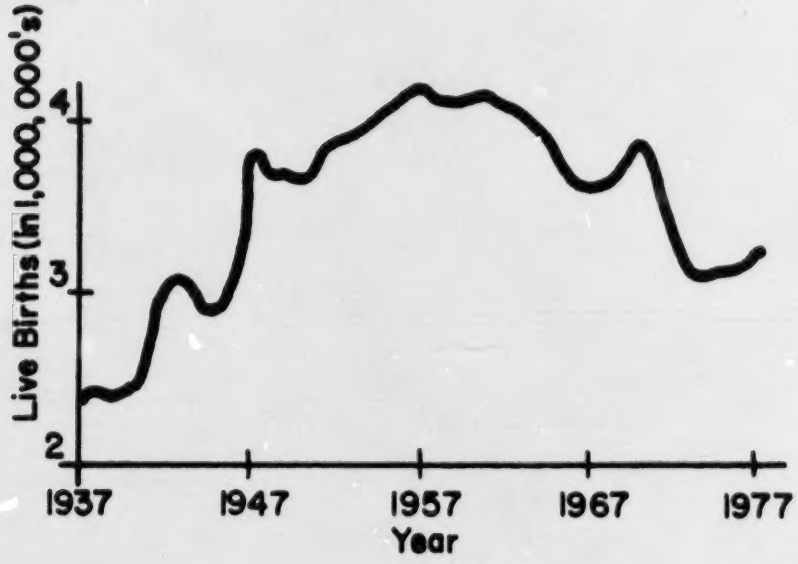
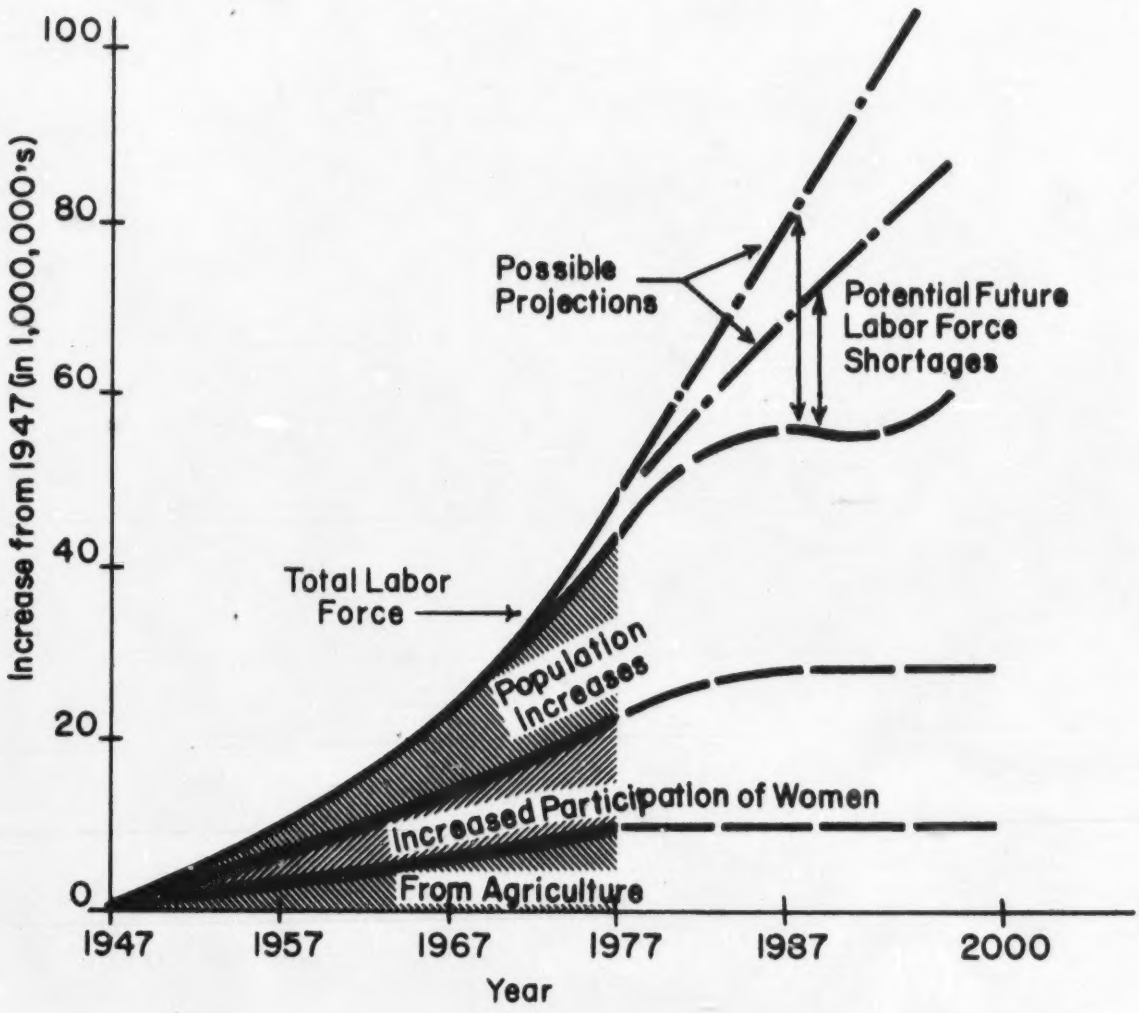


Figure 4. Labor Force Demand and Probable Supply Shown as Increases From 1947-77



Finally, the expected drastic drop in the labor demand as anticipated through the influences of automation and computers has not happened and probably will not happen to any significant extent. Therefore, as shown in Figure 4, rather than a glut of potential workers, we can more likely expect a serious shortage in potential labor participants.

What Happened?

What went wrong with the predicted influences of automation and computers? Did not these two influences release American workers from routine, monotonous, drudgery jobs? With the experience gained during the past thirty years, we can now explain both the fulfillment of the promise of automation and technology and its influence upon work and the work place as well as the unfulfillment of the prediction.

Automation, computers, and other technology have more than fulfilled their promise of eliminating routine jobs such as manually adding columns of figures, counting inventories, digging ditches, and many other such jobs in the office, construction and the factory. To the point, a statement made by a California banker, in 1970, estimated that had not the computer been invented it would have taken the entire population of the State of California to do the banking for that same population. Considerable statistical evidence is available documenting the elimination of jobs by automation and computers.

A number of factors contribute to nonrealization of the prediction of drastically reduced labor demand. A major factor was the large number and variety of new occupations generated by that very technology, jobs which did not exist in the past. Also, not only anticipated was the continued shift from primary to secondary to tertiary industries with a resultant explosive growth in the service industry sector. Another major factor has been the immergence of the post-industrial society, or the communications revolution as it is often termed, with its requirement of a large variety of new occupations.

What About the Future?

We are now witnessing the beginnings of another major cycle in the applications of technology through the expanding use of microelectronics, sophisticated robotry, the marriage of the computer and television, and the rapidly expanding telecommunications field. As the transistor heralded the first predictions of the impact of technology upon the work place, the integrated circuit with its miniaturization through Large Scale Integration (LSI) and Very Large Scale Integration (VLSI) are making possible a second major cycle.

Nevertheless through experience, one is hesitant to predict again the significant down trend in the labor demand. Rather, the significance of the past thirty years would lead one to believe that, similarly, new jobs will be created keeping the labor demand at the current rate or with only a minimal reduction (see projections on Figure 4). Assuming a fair degree of reliability for this major thesis, we can expect a significant short fall in the labor supply as compared to demand into the future. There are three possible sources for this supply, namely, delayed retirement, immigration, and better utilization of potential manpower.

By delaying retirement through a variety of statutes and incentives, by five years, a new source of approximately 5 million experienced workers can be obtained.

By allowing, and even encouraging, immigration, principally from Central and South America, a significant portion of this shortfall can be supplied. However, care must be taken to avoid the potential sociological problems brought about by a bilingual, bicultural American society which would gradually evolve from this policy.

Society's Rejects

The greatest potential supply and, possibly, the most logical one would involve greater utilization of individuals in our society, not now in the labor force but who, under the appropriate circumstances, could be brought in. This includes those of the non-institutionalized population who are not current in the labor force, either employed or unemployed. The percentage of individuals in this category dropped from 41% in 1947 to 37% in 1977. This group includes women (and increasingly men) who are out of the labor force for the purposes of child raising and homemaking, individuals attending various levels of schooling on a full-time basis, the retired, the disabled, others on a variety of social assistance, and those who, for a variety of reasons, have opted out of society.

Of the above, it appears that certain groups comprise "society's rejects" in our society, a collection of individuals who we find more convenient to subsidize by unemployment and other social assistance than to prepare for jobs. For most, if not all, of these individuals there is not an "employment gap" but a "training gap" between them and jobs.

The percentage of unemployed members of the labor force (those unemployed but looking for work) has remained above the 1977 figure of 7.0% for a current total of over 7 million individuals. It is also currently estimated that there are about that many jobs vacant giving credence to the notion of a "training gap."

Of the 59 million individuals (37%) in 1977 not in the labor force, 16.5 million were males and 42.5 million were females. Totals in millions, by reason given include: in school 7.7, ill health or disability 5.3, house responsibilities 31.5, retirement or old age 8.9, think they cannot get a job 1.1, and all others 4.5. Estimates of the number of these individuals who would join the labor force given the appropriate opportunity and training range from 10 to 20 million.

Thus, it appears that providing appropriate training and support activities for potentially productive members of "society's rejects" make good economic sense as well as humanitarian sense.

Training Required

Twenty years of experience with federal programs targeted at these audiences, such as Manpower Development and Training Act (MDTA), Work Incentive Programs (WIN), Concentrated Employment and Training Act (CETA), and their predecessors have demonstrated the types of training required. For the most part, they include basic literacy skills, life (or coping) skills, and employment skills. Although quite successful, total success of these federal programs has been limited by their emphasis upon employment training without the full provision of necessary basic skills training and life skills training. Future programs should take advantage of this experience.

Conclusion

Unless there is an unforeseen dramatic downward shift in the future labor force requirements in the United States, a continued growth in demand, which in the past was satisfied by the reduction of farm workers required, an increasing participation of women in the labor force, and a cyclic baby boom, will bring on a slight to severe labor shortage.

This potential shortage provides a unique opportunity, for both economic and humanitarian reasons, to allow full participation in American life, through the provision of appropriate training and support services, to millions currently denied that opportunity.

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